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CARDIAC TRANSPLANTATION IN CHILDREN WITH CONGENITAL HEART DISEASE

Daphne T. Hsu, Linda J. Addonizio, Craig R. Smith, Eric A. Rose, Welton M. Gersony, Columbia University, New York, New York.

Cardiac transplantation (CT) offers an alternative to high-risk corrective surgery in the pediatric pt with congenital heart disease (CHD) and depressed ventricular function. However, the outcome of these pts may be influenced by factors related to their CHD.

We have performed CT in a total of 49 pediatric pts, 17 with CHD (mean age 9.4±6.7 yrs). The indication for CT was ventricular failure in 15/17 pts: 12 pts had undergone previous cardiac surgery, 3 were unoperated. Two neonates were not felt to be candidates for surgical repair. Ten pts required pulmonary artery reconstruction, 8 pts had transposed great vessels, 1 pt had dextrocardia and 1 pt had systemic and pulmonary venous anomalies. The 17 pts with CHD were compared to the 32 pts without CHD. 6/17 pts with CHD had PVRI>6, not significantly different from the 17/32 pts without CHD with PVRI>6. No significant difference in ischemic time (mean 179±59 v. 168±59 minutes), pt survival (mean 15±18 v. 20±17 months), rejection incidence or infectious episodes was seen between pts with and without CHD. 7/17 pts with CHD died (4 pts < 3 mo. post-CT: 1 of donor failure, 2 of sepsis, 1 of acute rejection and 3 pts > 3 mo. post-CT: 2 from rejection, 1 infection), this was not significantly different from the 11/32 pts without CHD who died.

In summary, CHD did not adversely effect the outcome of pediatric patients following CT. CT should be considered in the patient in whom corrective surgery is felt to be high risk due to the complexity of the CHD or poor ventricular function.

CONSEQUENCES OF HETEROTOPIC HEART TRANSPLANTATION ON THE NATIVE HEART

Claudio Muneretto, André Marquand, Michèle Desruennes, Michel Aupart, Valéria Bors, Alain Pavie, Iradj Gandjbakhch, Christian Cabrol, La Pitié Hospital, Paris, France

We studied 20 consecutive pts with ischemic heart disease who underwent heterotopic heart transplantation (HTx) between January 1988 and June 1990. We performed hemodynamic studies and Doppler Echocardiography before and after heterotopic HTx, 10 and 30 days after HTx.
After HTx, mean pulmonary artery pressure decreased from (mean +/- sd) 34 +/- 12 mmHg to 21+/-10 ($p<0.05$) and pulmonary artery wedge pressure decreased from 22 +/- 9 to 10 +/- 7 ($p = 0.01$); cardiac index increased from 1.9 +/- 0.5 l/mn.m^2 to 3.4 +/- 0.7 l/mn.m^2 ($p = 0.01$).
Native heart tricuspid regurgitation was found unchanged on Doppler color flow mapping and velocity assessement.
Native heart mitral regurgitation significantly increased after HTx, from grade 0.8 +/- 0.4 to 1.7 +/- 0.6 ($p = 0.02$)
Mild aortic regurgitation appeared after HTx in 10 pts.
Native heart end-systolic and end-diastolic left ventricular diameters, left ventricular ejection fraction assessed by 2 dimensional and TM echocardiography were found unchanged after HTx.
Conclusion
1.After heterotopic HTx, an aortic regurgitation appeared in 50% of our pts along with a significant increase of the mitral regurgitation of the native heart.
2.These abnormalities might be related to the asynchronicity of the two parallel hearts
3.These abnormalities do not prevent improvement of the hemodynamic status

EFFECT OF TEMPORARY LEFT VENTRICULAR ASSIST (NOVACOR) SYSTEM ON CARDIAC HEMODYNAMICS, VENTRICULAR FUNCTION CAPACITY IN CHRONIC SEVERE CARDIAC FAILURE

Srinivas Murali, William P. Follansbee, Barry F. Uretsky, Robert L. Kormos, John M. Armitage, Robert L. Hardesty, P. Sudhakar Reddy, Bartley P. Griffith, University of Pittsburgh, Pittsburgh, PA

Temporary left ventricular assist (NOVACOR) system (LVAS) has been utilized as a bridge to cardiac transplantation. To evaluate the potential of this mechanical device as a self-contained permanent unit, several parameters were measured in 7 male pts with NYHA class IV biventricular cardiac failure (CHF) before and after LVAS implantation. Hemodynamics before (range 1-36 days) and after (range 4-144 days) LVAS support were measured and ventricular function assessment by radionuclide angiography (RNA) was performed before (range 2-36 days) and after (range 42-93 days) LVAS insertion. Functional capacity was evaluated by exercise testing and measurement of peak oxygen consumption (VO_2, ml/min/kg) after (range 34-123 days) LVAS implantation.

	PAM	PAW	CO	RVEF	LVEF	VO_2
Pre-LVAS	39±8	23±7	3.7±0.5	10±5	16±8	
Post-LVAS	24±7*	9±5*	6.1±0.9*	28±7*	58±16*	15.8±6.3

$p < 0.05$ post vs. pre-LVAS; PAM, PAW = PA mean, PA wedge pressures (mmHg); EF = ejection fraction (%). All pts undergoing RNA demonstrated a decrease in LV size after LVAS support. CONCLUSION: Temporary LVAS support improves cardiac hemodynamics, RV and LV function and exercise capacity in NYHA class IV CHF pts with biventricular failure. These favorable effects on cardiac function support the development of a permanent implantable LVAS for pts with severe refractory CHF.

INADEQUATE ERYTHROPOIETIN PRODUCTION IN CARDIAC TRANSPLANT PATIENTS WITH ANEMIA

Jon Kobashigawa, Lynne W. Stevenson, Jaime Moriguchi, Nobuyuki Kawata, Erica Brownfield, Lisa Leonard, Roxella Fandrich, Patricia Sheehan, Davis Drinkwater, Hillel Laks. UCLA School of Medicine, Los Angeles, CA.

Anemia unresponsive to iron therapy occurs in some pts after cardiac transplant (Ctx) and does not appear to result from differences in immunosuppression. To determine whether these pts have depressed erythropoietin (Epo) production, Epo serum levels were measured in 53 Ctx pts between 6/90 and 8/90, who were >3 months after Ctx. All Ctx pts were on triple drug immunotherapy including azathioprine 2 mg/kg/day. The pts were divided into 3 groups according to hemoglobin level (Hb). Although Epo production should be increased in response to anemia, Epo levels were lowest in the lowest Hb group (Group 1). Serum creatinine was higher in Group 1 than in Group 3, but did not reach significance ($p=0.10$).

	N	Hb (gm/dl)	Hct (%)	Epo (mIU/ml)	Creat (mg/dl)
Group 1	18	<12	32±2	5.5±4.6	1.8±.6
Group 2	12	12-13	36±2	7.8±4.6	1.6±.3
Group 3	23	>13	41±4	7.8±4.8	1.5±.4

Epo levels are inappropriately low in Ctx pts with anemia, and may relate to renal effects of cyclosporine. It is not yet known whether such anemia will respond to therapy with Epo.